

# THE TRANSIT OF VENUS.

## LETTER FROM PROF. YOUNG AT PEKING.

THE START OF THE OBSERVATION PARTIES FROM SAN FRANCISCO—CROSSING THE PACIFIC—REMARKS ON THE STEAMERS—ARRIVAL AT YOKOHAMA—IMPRESSIONS OF JAPAN—TO PEKING—SETTING UP THE INSTRUMENTS AND BEGINNING OBSERVATIONS.

PEKING, China, Monday, Nov. 2, 1874.  
A Pacific voyage is seldom interesting in itself, and that of the Alaska, which carried the scientific parties sent out by the United States Government to observe the coming transit of Venus at Wladiwostok and Peking formed no exception to the general rule. The Wladiwostok party consisted of Prof. A. Hall, of Washington, as Chief; Mr. O. B. Wheeler, of Detroit, Assistant Astronomer; Mr. D. B. Clark, of Indianapolis, Chief Photographer; Messrs. Tappan of Cincinnati, Lacy of Peru, Ind., Rockwell of New-York, Assistant Photographers; and Mr. Gardner, of Washington, as Mechanician. Our own party consists of Prof. J. C. Watson, of Michigan University, as Chief; Prof. C. A. Young, of Dartmouth College, Assistant Astronomer; T. P. Woodward, of San Francisco, Second Assistant; W. V. Ranger, of Syracuse, N. Y., Chief Photographer, and Messrs. E. Watson and B. J. Conrad, of Michigan, Assistant Photographers. Prof. Watson's wife also accompanies him. A third party, under the charge of Prof. G. Davidson, of the United States Coast Survey, and destined for Nagasaki, did not accompany us as we had hoped, but sailed a month later.

We left San Francisco on the 28th of July and landed at Yokohama on the 23d of August, in the midst of a gale of wind, which proved to be the edge of a typhoon by which Nagasaki had been devastated the preceding night. With this exception the weather during the whole voyage was either fine, or at the worst a little showery, and the smoothness of the water was a continual and very gratifying surprise to one whose ideas of sea-going had been derived from a little experience on the Atlantic. The loneliness of this sea is striking. From the time of leaving the coast of California until we entered the Bay of Yeddo, we did not see a single sail, nor any living thing except a whale or two, with occasional schools of flying-fish and porpoises, and always the patient gulls which followed us quite across the ocean. But the ship herself deserves a good word, for the most experienced voyagers among us agreed that we never found a vessel so comfortable, so well provided, and so well managed. Poor old Alaska! A week or so after we left her she broke her shaft, on her way down to Hong Kong, and while lying in the harbor there, repaired and nearly ready to sail, she was caught by the typhoon of September and driven ashore upon the rocks, from which she is hardly likely to get off.

These steamers, however—the Alaska and her consorts, the Japan, Colorado, and Great Republic—have serious faults; they are slow, requiring from twenty-two to twenty-six days to make a voyage which a screw vessel can accomplish in a week's less time; and in case of any disaster to their machinery, especially upon so lonely an ocean, they are very helpless, having no sailing power worth mentioning, and exposing to the wind such a huge surface of upper-work and paddle boxes as to put them quite at its mercy if the engine fails.

The new steamers now being placed upon this route, the City of Peking and City of Tokio, will be free from these objections, swift, and able to go respectably under sail alone.

IMPRESSIONS AT YOKOHAMA.  
Our parties remained a few days at Yokohama, making the usual excursions to Yeddo, or more properly Tokio. Kamakura, Enoshima, and Daibutz. To most of us everything was new and very strange; indeed, we imagined that many things we saw were quite as strange to the natives as to ourselves, for the contact of European and Asiatic civilizations has developed a bizarre life full of the oddest contrasts. For instance, perhaps one of the most striking institutions of the country is the jinriksha, a sort of magnified baby-cart, in which a coolie draws a full-grown man at the rate of five or six miles an hour; the most convenient cab in the world, in which horse and driver are combined in one. Well, on several occasions we saw in these concerns European ladies, elegantly dressed in full evening costume, on their way to some dinner party, drawn by stout coolies whose only clothing was the tattooing upon their backs, and breech cloths, four inches wide. One doesn't mind it after a while, but at first it seems very odd. So it did to see a naked coolie operating a sewing machine. The jinriksha, by the way, is a new thing, devised only four or five years ago by one of the American missionaries, and so exactly adapted to the country that it is fast becoming universal. In Yeddo alone there are said to be 70,000 of them, and probably the estimate is none too large. The manners and ideas of the people are all evidently in a state of most rapid transition. Every year, we are told by the foreigners who reside in Japan, produces great changes, and the nation now seems as anxious to adopt European civilization as it was determined to exclude it ten years ago. Those who wish to see the Japan of history must make haste. Railroads, telegraphs, and steam-boats, rifles, sewing machines, petroleum, and coal gas are powerful alternatives when administered to a nation. More profound yet is the influence of the waning faith in their old religion, and a growing disposition to accept the cardinal doctrines of Christianity; but what will be the final outcome it is not easy to foresee. On the whole, the impression made by the people and the country was a very pleasant one, such as would lead to hopefulness.

TO NAGASAKI.  
We sailed from Yokohama for Nagasaki on the 27th, and reached Nagasaki on Sept 1, stopping at Kobe and Hiogo one day. Hiogo is an old Japanese city, Kobe the foreign concession adjoining it and now rivaling the other in population. Both Kobe and Yokohama have grown most remarkably from the little fishing villages they were twenty years ago to cities of nearly 100,000 inhabitants. Hiogo and Kobe are now connected by rail with Osaka, the Venice of Japan, some sixteen miles distant, and the line is being rapidly extended as much further to Kyoto, the old capital of the Mikados. From Hiogo to Nagasaki our course lay mostly through the "inland sea," and a more beautiful voyage it would be hard to imagine. The sea is so land-locked that the water is like a pond for smoothness, and dotted with sails which we counted literally by the hundred. The shores are bold and picturesque, but populous and most thoroughly cultivated, and countless glands rise on every side, some mere rocks, and others supporting a busy people.

EFFECTS OF THE TYPHOON.  
Nagasaki we found disconsolate. The typhoon, ten days previous, had, without much

metaphor, knocked things endways. The houses were some in ruins, some unroofed, and all more or less dilapidated. The bund or street along the water's edge was covered with huge blocks of stone driven out of the sea-wall by the waves. The trees were stripped of their leaves and shattered, the shipping in the harbor, nearly all of it was more or less broken and crippled. The great iron ram Stonewall, which the Japanese purchased from our Government, lay on the rocks with a hole in her bottom. Everything, however, was being repaired with quite American vigor, but in consequence of the state of things we were obliged to rough it a little in our hotel accommodations for the three or four days we had to stay there.

TO PEKING.  
We found Admiral Pennock expecting our arrival, and zealous to do everything in his power to facilitate our object. He had been ordered to detail the Lackawanna to take our parties to their destination, but as her boilers had given out shortly before, he was compelled to go by the spirit of his orders rather than the letter, and made arrangements for us even more convenient than had been originally contemplated, by giving us two vessels instead of one, and that without any additional burden upon the naval service. The Kearsarge, of Alabama fame, was detailed for the conveyance of Prof. Hall's party, and ours was provided for upon the Ashuelot, which was at any rate to cross to China very soon, and being of light draught would be able to take us up the Peiho River as far as Tien-Tsin, instead of dropping us at the mouth, as the Lackawanna must have done.

We sailed on the 3d of September, and, after a very pleasant passage, reached Tien Tsin on the 9th. We went up the river from Tien Tsin to Tung Chang in the usual manner—on small house-boats—and from the latter place completed our long journey by a sixteen-mile ride on donkeys, reaching the imperial city late on Sept. 16, very sore and weary, but grateful and happy over our safe arrival.

We did not find the arrangements made for us which we had expected, the State department at Washington having failed in its promise to send to the legation the necessary information and instructions. Fortunately, on our arrival at Tien Tsin we had sent up a courier to Mr. Williams, our Chargé d'Affaires, announcing our coming, so that he had two or three days' notice and had made provision for our immediate wants.

THE OBSERVATION STATION.  
Our first care, of course, was to select a station for observation, and we were very fortunate in finding an excellent one upon the premises of the mission of the English Church Missionary Society in the western part of the city, about one mile from the western wall and a quarter of a mile north of the wall which separates the Chinese and Tartar cities. Rev. Mr. Collins, who is in charge of this mission, and is also the chaplain of the British Legation, merits, and has, our profoundest gratitude for the zealous and generous manner in which he has aided us in every way, interpreting for us, acting as our agent to some extent in our dealings with the Chinese, giving us the use of his grounds and of rooms in his house, and all without compensation or reward.

Unfortunately, we are not able to live very near our station, not being able to secure suitable accommodations in the immediate vicinity, but have been obliged to set up a sort of half-way housekeeping in some vacant rooms on the premises of the American Episcopal Mission, about a mile nearer to the legations and the centre of the city. It is very inconvenient to live at such a distance from our work, but we could find no way to avoid the difficulty.

Our instruments arrived from Tung Chang on the 17th, slung on poles and carried by coolies, and on the 18th we began the work of setting up our station, which with Chinese labor proved a long and vexatious job, and was not fully completed until about the 10th of October. The more important instruments were, however, in place much earlier, so that regular observations commenced on Sept. 28. Indeed, on the night of Oct. 10, Prof. Watson, continuing the same line of research which has long since made him famous, discovered a new planet, to which he proposes, on the suggestion of Dr. Williams, to give the name of Ne-wha, the Chinese goddess who once repaired the sky when it became dilapidated.

## ARRIVAL OF THE INSTRUMENTS—OBSERVATIONS BEGUN.

Our instruments all arrived in perfect order; nothing missing or injured, a most unusual experience we fear in the case of a scientific expedition. The buildings which shelter them are placed in an inclosure of somewhat irregular form, but approximately rectangular, measuring about 150 feet long from east to west and 75 from north to south. In the extremenorth-west corner of the grounds are placed the magnetic instruments. About fifty feet further east and near the north wall (which is about twelve feet high) is placed the little octagonal observatory with its revolving roof, under which is mounted the "equatorial." This is the principal instrument; a beautiful telescope of five inches diameter, with complete clockwork and accessories, made by Clark, of Cambridge.

About thirty feet east of this is the "transit house," in which are placed the instruments by which we determine our latitude and time, viz., a "transit instrument," so called, a chronograph, a clock, three chronometers, and some other minor instruments. The photographic house is due south from the transit house, at a distance of about sixty feet, and is situated in a recess in the southern wall. Between the two houses, and forty feet from the photographic-house, stands the iron pier upon which are placed the heliostat and the lens upon which the image of the sun is formed in the photographic-house upon the prepared plate. The plate itself is carried by an iron pier inside the photographic-house, the light being admitted to form the picture by a narrow slit in a thin plate of metal, which, at the moment of exposure, is shot across in front of the plate by a strong spring.

The heliostat is a reflector of *unsilvered* glass, most carefully worked to a perfectly flat surface, and moved by a clock-work in such a manner as to keep the reflected image of the sun in its proper place notwithstanding the rotation of the earth.

I have spoken of the equatorial as the "principal" instrument, but, perhaps, this is questionable, for, although the observations and measurements to be made with it at the beginning and end of the transit exceed in importance any other *single* observation, yet it is quite probable that the photographs taken collectively may prove even yet more valuable, and, it so, the photographic apparatus might claim the pre-eminence. Between the heliostat pier and the photographic-house extends a long, shed-like structure of mats, designed to prevent as much as possible currents or tremors of the air along the path of the rays of light. Just west of the heliostat pier stands a small hut of matting, in which are mounted Prof. Young's spectroscope and a small telescope. Lines of telegraphic wire connect the different houses

with the transit room and the chronograph. Mats are laid down between the houses along the pathways, and the rest of the yard is kept moist by continual sprinkling in order to keep down the dust, which here in Peking seems to be the worst enemy of every delicate instrument.

At present, although there remains abundance of work to do before the transit, we have everything in such a state of forwardness that there can be no doubt that the event will find us fully prepared and with our work all finished, so that we shall be ready to take our departure immediately. So far as we can learn, however, this departure from Peking in the Winter is likely to be a pretty difficult and uncomfortable business. If possible, Admiral Pennock will undoubtedly send a vessel to the mouth of the Peiho to take us off, and in this case we should get off very comfortably, with only a three days' journey by land. Failing this, however, we shall have to make at least a twelve days' journey overland to Chefoo or else to Chingkiang.

A FRENCH PARTY—THEIR INSTRUMENTS.  
There is besides our own party a French party here on the same errand, consisting of Lieuts. Fleuriais, Blarez, and Lapiet, of the French Navy. In some respects their apparatus is very fine—much superior to ours. They have, for instance, two equatorials, one of eight inches and the other of six inches in diameter, and either of them much larger than ours. On the other hand, our photographic apparatus and meridian instruments are better than theirs. Their station of observation is on the grounds of the French Legation, about two miles east of here, and a few hundred feet further south. A sad misfortune, has, however, overtaken them, which overshadows the whole foreign community here, casting a gloom which even the happy settlement of the Formosan difficulty can hardly lighten. Lieut. Blarez has been struck by paralysis—a complete hemiplegia of the right side—rendering him entirely helpless, and it is greatly feared likely to terminate fatally, and that very soon. The cause is unknown. Our party has, indeed, great reason to be thankful, for, with slight exception, none of us have been ill since leaving home, and at present we are all in the best of health.

The Russians have also one observer here—an astronomer and physicist, Dr. Fritsche, who has been for some years stationed here as a meteorological and magnetic observer.

But this long and rambling letter must come to a close. It is to be hoped that the 9th of December will be fine, and the chances of fair weather here at that time of the year fall little short of certainty; no other station on the globe shows a better weather record for December during the past ten years. If things go well then you shall hear from me again.

C. A. YOUNG.

Dispatch to the Associated Press.  
SUCCESS OF PROF. PETERS' OBSERVATIONS.  
WASHINGTON, Dec. 30.—The Smithsonian Institution received a telegram to-day from Prof. Airy, Astronomer of the Royal Greenwich Observatory, stating that the observations of Prof. Peters, one of the American observers of the transit of Venus at New-Zealand, were a perfect success, and that 237 photographs were made of the first contact.